CLAIMS

We claim:

1. A temporarily protected wafer, comprising:

   a sensitive area disposed on a surface of the wafer; and

   a vapor-deposited, water-insoluble temporary protective coating covering the sensitive area; wherein the coating remains in place during singulation of the wafer into individual device dies; and further wherein a sufficient amount of the coating is removed to activate the sensitive area prior to completing packaging of the die.

2. The temporarily protected wafer of claim 1, wherein the sensitive area comprises a released MEMS device.

3. The temporarily protected wafer of claim 1, wherein the sensitive area comprises a pressure-sensitive microsensor.

4. The temporarily protected wafer of claim 1, wherein the sensitive area comprises a chemically-sensitive microsensor.

5. The temporarily protected wafer of claim 1, wherein the sensitive area comprises a temperature-sensitive microsensor.

6. The temporarily protected wafer of claim 1, wherein the sensitive area comprises a released IMEMS device.

7. The temporarily protected wafer of claim 1, wherein the temporary protective coating comprises a vacuum vapor-deposited coating.

8. The temporarily protected wafer of claim 7, wherein the vacuum vapor-deposited coating comprises a parylene polymer.

9. The temporarily protected wafer of claim 8, wherein the parylene coating is selected from the group of parylene polymers consisting of poly-para-xylylene, poly-para-xylylene modified by the substitution of a chlorine atom for one aromatic hydrogen, and poly-para-xylylene modified by the substitution of a chlorine atom for two aromatic hydrogens.

10. The temporarily protected wafer of claim 8, wherein the parylene coating comprises a copolymer coating formed by blending the parylene polymer with a reactive material.
11. The temporarily protected wafer of claim 10, wherein the reactive material comprises a monomer containing an element selected from the group consisting of silicon, carbon, and fluorine, and combinations thereof.
12. The temporarily protected wafer of claim 1, wherein the temporary protective coating comprises silicon dioxide, silicate glass, or silicon nitride.
13. The temporarily protected wafer of claim 1, wherein the temporary protective coating comprises a metal.
14. The temporarily protected wafer of claim 13, wherein the metal comprises aluminum or tungsten.
15. The temporarily protected wafer of claim 1, wherein the temporary protective coating comprises a vapor deposited organic material.
16. The temporarily protected wafer of claim 1, wherein the temporary protective coating comprises cynoacrylate.
17. The temporarily protected wafer of claim 1, wherein the temporary protective coating comprises a carbon film.
18. The temporarily protected wafer of claim 1, wherein the temporary protective coating comprises a self-assembled monolayered material.
19. The temporarily protected wafer of claim 1, wherein the temporary protective coating comprises a material selected from perfluoropolyether, hexamethyldisilazane, and perfluorodecanoic carboxylic acid.
20. The temporarily protected wafer of claim 1, further comprising exposed bond pads.
21. The temporarily protected wafer of claim 1, wherein the temporary protective coating is deposited using a Chemical Vapor Deposition (CVD) process.
22. The temporarily protected wafer of claim 1, wherein the temporary protective coating is deposited using a Plasma Enhanced Chemical Vapor Deposition (PACVD) process.

23. The temporarily protected wafer of claim 1, wherein the temporary protective coating is deposited at essentially ambient temperature.

24. The temporarily protected wafer of claim 1, wherein the temporary protective coating is deposited by polymerizing a monomeric gas on at least the sensitive area.

25. A temporarily protected die, comprising:

a sensitive area disposed on a surface of the die; and

a vapor-deposited, water-insoluble temporary protective coating covering the sensitive area; wherein a sufficient amount of the coating is removed to activate the sensitive area prior to completing packaging of the die.

26. The temporarily protected die of claim 25, wherein the sensitive area comprises a released MEMS device.

27. The temporarily protected die of claim 26, wherein the temporary protective coating comprises a parylene polymer.

28. A temporarily protected wafer, comprising:

a sensitive area disposed on a surface of the wafer comprising a released MEMS device having a released MEMS element;

a performance-enhancing coating disposed on the released MEMS element; and

a vapor-deposited, water-insoluble temporary protective coating disposed on top of the performance-enhancing coating; wherein the coating remains in place during singulation of the wafer into individual device dies, and further wherein a sufficient amount of the coating is removed to re-release the MEMS element prior to completing packaging of the die, without removing the performance-enhancing coating.

29. The temporarily protected wafer of claim 28, wherein the performance-enhancing coating is selected from an anti-stiction film, an adhesion-inhibiting film, a lubricant, and a nitrided-surface.

30. The temporarily protected wafer of claim 29, wherein the performance-enhancing coating is selected from perfluoropolyether, hexamethyldisilazane, and perfluorodecanoic carboxylic acid.

31. A partially-packaged, temporarily protected microelectronic device, comprising:

a microelectronic device attached to a package;

a sensitive area disposed on the microelectronic device; and

a vapor-deposited, water-insoluble temporary protective coating covering the sensitive area; wherein a sufficient amount of the coating is removed to activate the sensitive area prior to completing packaging of the device.

32. The device of claim 31, wherein the sensitive area comprises a released MEMS element.

33. The device of claim 31, wherein the microelectronic device is electrically interconnected to the package.

34. The device of claim 33, wherein the microelectronic device is wirebonded to the package.